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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/708,224	02/18/2004	Masuhiko Natsuhara	39.033	2223
29453	7590	03/08/2006	EXAMINER	
JUDGE PATENT FIRM RIVIERE SHUKUGAWA 3RD FL. 3-1 WAKAMATSU-CHO NISHINOMIYA-SHI, HYOGO, 662-0035 JAPAN			PAIK, SANG YEOP	
			ART UNIT	PAPER NUMBER
			3742	

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/708,224

**Applicant(s)**

NATSUHARA ET AL.

**Examiner**

**Sang Y. Paik**

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 20 December 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi (US 6,071,465).

Kobayashi shows a semiconductor manufacturing device including a substrate with a resistive heating element, a substrate-supporting shaft joined to the substrate, wherein each surface of the substrate and the supporting shaft is grinded to have the surface roughness of .1  $\mu\text{m}$  and a flatness of .1  $\mu\text{m}$  (see column 13, lines 7-11; and Figure 10). But, Kobayashi does not explicitly show the claimed distance where the distance between the central axis of the shaft and the center of the substrate is 5% or less of the diameter of the wafer-carrying side of the substrate.

Kobayashi shows in its drawing figures that the center of the supporting shaft is aligned with the center of the substrate. While the claimed distance is not explicitly disclosed, it would have been obvious to one of ordinary skill in the art to have the center of the supporting shaft be aligned with the center of the substrate within the claimed range to prevent imbalancing of the substrate on the supporting shaft as the substrate is further provided to support a wafer thereon. The balancing of the substrate would be vital for proper processing of the wafer as it needs to be properly positioned on the substrate for even heat distribution without being moved more to one side or the other.

Kobayashi further shows that the substrate and the supporting shaft are made of aluminum nitride as that of the disclosed invention, and since Kobayashi shows the same structure as that of the claimed invention, Kobayashi would inherently meet the claimed thermal expansion of coefficient along with the claimed temperature distribution in the wafer-carrying side of the substrate within 1.0%.

### *Response to Arguments*

3. Applicant's arguments filed 12/20/05 have been fully considered but they are not persuasive.

The applicant argues since Kobayashi does not show the claimed distance between the center axis of the shaft to the axial center of the wafer-carrying side of the substrate. The examiner does not contend that Kobayashi explicitly shows such claimed distance, but contend that it would have been obvious to one of ordinary skill in the art to provide the axial centers of the substrate and the shaft within the claimed distance. As presented in the ground of rejection, having the axial centers for both the substrate and shaft would have been obvious to maintain a good balance upon which a work-piece such as a wafer is to be placed, and having a stable and balance heating surface would have ensured such uniform heating across the heating surface without having the wafer tilted more to one side than the other. Kobayashi realizing the importance of having a proper machined surfaces and the flatness of the device that is in a micro scale would have been further motivated to achieve a stable balance of the substrate with respect to the shaft to ensure a desired heating distribution along the heating surface.

It is well known in the art that the semiconductor wafers are in the diameter range of 200-300 mm with the wafer heater having the support with same or larger diameter to that of the

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wafer. Having the claimed gap of 5% to such support would be in the range of 10-15 mm gap that would in the order of  $1 \times 10^4$  of the micro scale (microns) that Kobayashi was concerned about. Thus, one of ordinary skill in the art would have been motivated to provide the claimed distance within the claimed range to ensure the most stable and uniform surface heating as possible to more effectively heat a wafer thereon.

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Y. Paik whose telephone number is 571-272-4783. The examiner can normally be reached on M-F (9:00-4:00) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robin Evans can be reached on 571-272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SR

Sang Y Paik  
Primary Examiner  
Art Unit 3742

syp